



PHYSICS

0625/53

Paper 5 Practical Test

October/November 2019

CONFIDENTIAL INSTRUCTIONS



This document gives details of how to prepare for and administer the practical exam.

The information in this document and the identity of any materials supplied by Cambridge International are confidential and must NOT reach candidates either directly or indirectly.

The supervisor must complete the report at the end of this document and return it with the scripts.

If you have any queries regarding these confidential instructions, contact Cambridge International stating the centre number, the syllabus and component number and the nature of the query.

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This syllabus is regulated for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **8** printed pages.

General information about practical exams

Centres must follow the guidance on science practical exams given in the *Cambridge Handbook*.

Safety

Supervisors must follow national and local regulations relating to safety and first aid.

Only those procedures described in the question paper should be attempted.

Supervisors must inform candidates that materials and apparatus used in the exam should be treated with caution. Suitable eye protection should be used where necessary.

Before the exam

- The packets containing the question papers must **not** be opened before the exam.
- It is assumed that standard school laboratory facilities, as indicated in the *Guide to Planning Practical Science*, will be available.
- Spare materials and apparatus for the tasks set must be available for candidates, if required.

During the exam

- It must be made clear to candidates at the start of the exam that they may request spare materials and apparatus for the tasks set.
- Where specified, the supervisor **must** perform the experiments and record the results as instructed. This must be done **out of sight** of the candidates, using the same materials and apparatus as the candidates.
- Any assistance provided to candidates must be recorded in the supervisor's report.
- If any materials or apparatus need to be replaced, for example, in the event of breakage or loss, this must be recorded in the supervisor's report.

After the exam

- The supervisor must complete a report for each practical session held and each laboratory used.
- Each packet of scripts returned to Cambridge International must contain the following items:
 - the scripts of the candidates specified on the bar code label provided
 - the supervisor's results relevant to these candidates
 - the supervisor's reports relevant to these candidates
 - seating plans for each practical session, referring to each candidate by candidate number
 - the attendance register.

Specific information for this practical exam

Question 1

Items to be supplied by the centre (per set of apparatus unless otherwise specified)

- (i) A resistance wire about 105 cm in length. 32 swg (0.274 mm diameter) constantan (Eureka) is suitable, or any other wire with a resistance of approximately $8 \Omega \text{ m}^{-1}$. See note 1.
- (ii) Filament lamp, 2.5 V 0.2 A, or similar, in holder.
- (iii) Metre rule, graduated in mm. See note 1.
- (iv) Power supply of 2 V to 3 V. See note 3.
Where candidates are provided with a variable power supply, the voltage should be set by the Supervisor and fixed, e.g. taped.
- (v) Switch. The switch may be an integral part of the power supply.
- (vi) Sufficient connecting leads to set up the circuit shown in Fig. 1.1.
- (vii) Crocodile clip.
- (viii) Ammeter capable of measuring currents up to 1.00 A with a resolution of at least 0.05 A. See note 4.
- (ix) Voltmeter capable of measuring up to 3.0 V with a resolution of at least 0.1 V. See note 4.

Notes

1. The resistance wire is to be fixed to the metre rule in such a way as to allow candidates to connect a crocodile clip to lengths of the wire from 20.0 cm to 100.0 cm. The 0.0 cm mark of the metre rule must be in the position indicated in Fig. 1.1. If the metre rule has two scales in opposite directions, one must be taped over.
2. The circuit is to be set up for candidates as shown in Fig. 1.1, with the crocodile clip clipped to the resistance wire. The position of the crocodile clip is not important.

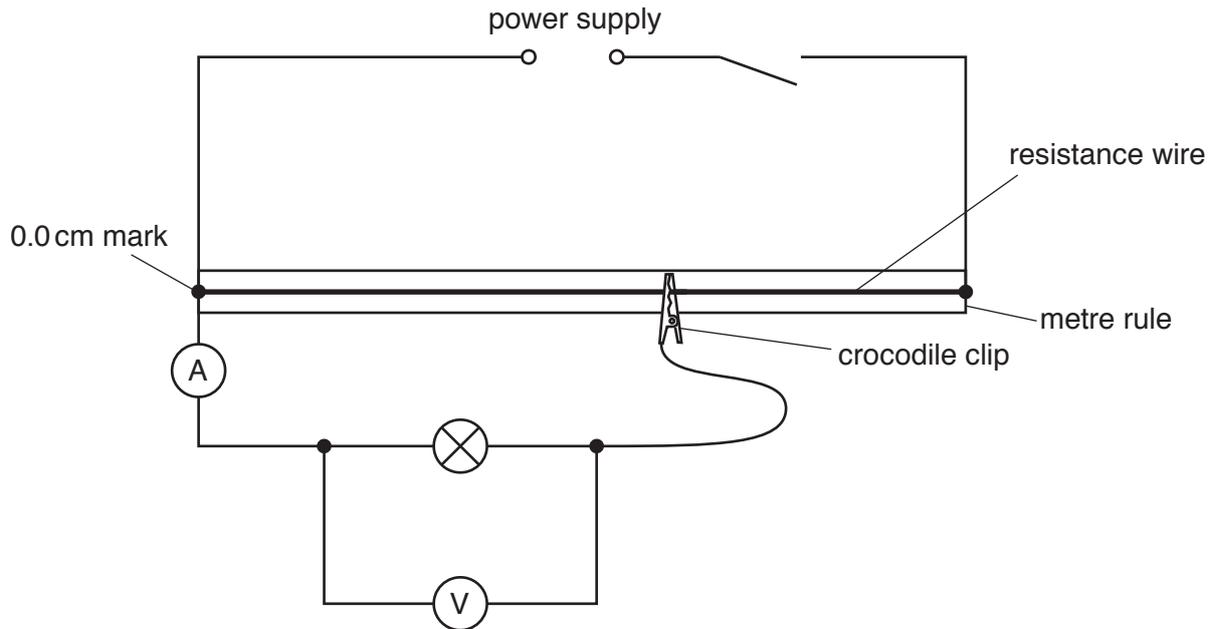


Fig. 1.1

3. If cells are used, they must remain adequately charged throughout the examination. Spare cells must be available.
4. Either analogue or digital meters are suitable. Any variable settings should be set by the Supervisor and fixed, e.g. taped. Spare meters should be available.

Action at changeover

Ensure that the circuit is connected as shown in Fig. 1.1 and check that the circuit and the lamp are working.

Switch the circuit off.

Question 2

Items to be supplied by the centre (per set of apparatus unless otherwise specified)

- (i) Converging lens of focal length approximately 15 cm to 18 cm with a suitable holder. See note 2.
- (ii) Metre rule, graduated in mm.
- (iii) Illuminated object consisting of rigid card with a triangular hole of height 1.5 cm (see Fig. 2.1). The hole is to be covered with thin translucent paper (e.g. tracing paper) secured with adhesive tape. See note 2.
- (iv) Screen. A white sheet of stiff card approximately 150 mm × 150 mm, fixed to a wooden support is suitable (see Fig. 2.2).
- (v) 50 cm or 30 cm ruler, graduated in mm. Candidates may use their own.

Notes

1. The lamp used for the illuminated object should be low voltage, 24 W or greater.
2. The lamp filament, the centre of the hole which forms the object and the centre of the lens in its holder must all be the same height above the bench.
3. The apparatus should be situated away from direct sunlight.

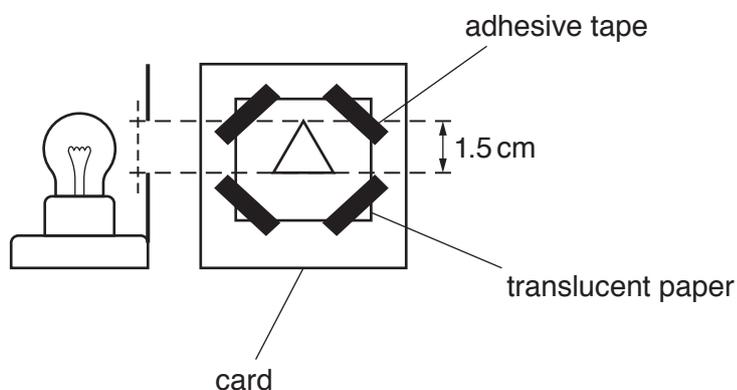


Fig. 2.1

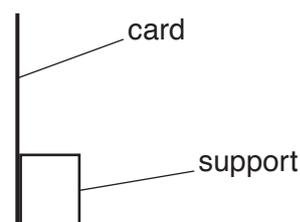


Fig. 2.2

Action at changeover

Check that the apparatus is intact and that the lamp is working.

Question 3

Items to be supplied by the centre (per set of apparatus unless otherwise specified)

- (i) Steel spring. See note 1.
- (ii) Clamp, boss and stand. See note 2.
- (iii) Masses of 100 g, 200 g and 300 g, labelled 1.0 N, 2.0 N and 3.0 N respectively. See note 3.
- (iv) Object of mass approximately 230 g, labelled 'X'. See note 4.
- (v) 50 cm or 30 cm ruler, graduated in mm. Candidates may use their own.

Notes

1. An expendable steel spring is suitable, for example a spring with a diameter of 16 mm and a length of 20 mm across the unextended coils (e.g. Philip Harris expendable steel spring B8G87194, www.philipharris.co.uk). The spring must be able to support a load of at least 5 N without overstretching.
2. The clamp, boss and stand must be set up with the spring suspended from the clamp. The stand must be sufficiently tall to support the spring with the 3.0 N load, without the load touching the bench.
3. The masses must each include a hanger so that they can be hung from the spring.
4. The object X must include a hanger. It could be formed from a 100 g mass hanger surrounded by modelling clay. It must be made up in such a way that candidates cannot easily detect its mass.
5. Spare springs must be available.

Action at changeover

Remove the load from the spring if necessary.

Check that the spring has not been deformed by overstretching and replace if necessary.

Question 4

No apparatus is required for this question.

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Supervisor's report

Syllabus and component number

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Centre number

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Centre name

Time of the practical session

Laboratory name/number

Give details of any difficulties experienced by the centre or by candidates (include the relevant candidate names and candidate numbers).

You must include:

- any difficulties experienced by the centre in the preparation of materials
- any difficulties experienced by candidates, e.g. due to faulty materials or apparatus
- any specific assistance given to candidates.

Declaration

- 1 Each packet that I am returning to Cambridge International contains the following items:
 - the scripts of the candidates specified on the bar code label provided
 - the supervisor's results relevant to these candidates
 - the supervisor's reports relevant to these candidates
 - seating plans for each practical session, referring to each candidate by candidate number
 - the attendance register
- 2 Where the practical exam has taken place in more than one practical session, I have clearly labelled the supervisor's results, supervisor's reports and seating plans with the time and laboratory name/number for each practical session.
- 3 I have included details of difficulties relating to each practical session experienced by the centre or by candidates.
- 4 I have reported any other adverse circumstances affecting candidates, e.g. illness, bereavement or temporary injury, directly to Cambridge International on a *special consideration form*.

Signed (supervisor)

Name (in block capitals)